Digital Aerial SketchMapping

A Multipurpose Field Mapping Tool

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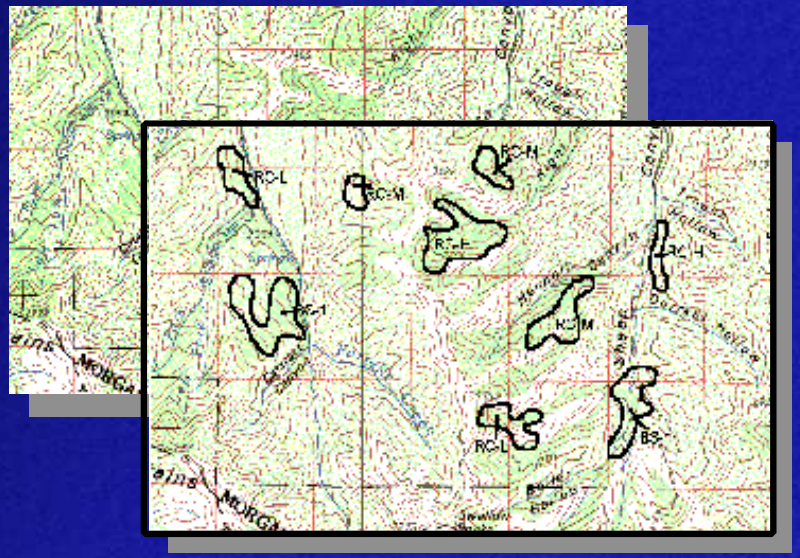
DASM Discussion Points

- What is sketchmapping?
- System nuts and bolts
- Benefits to PC based mapping
- Current use
- Emerging applications

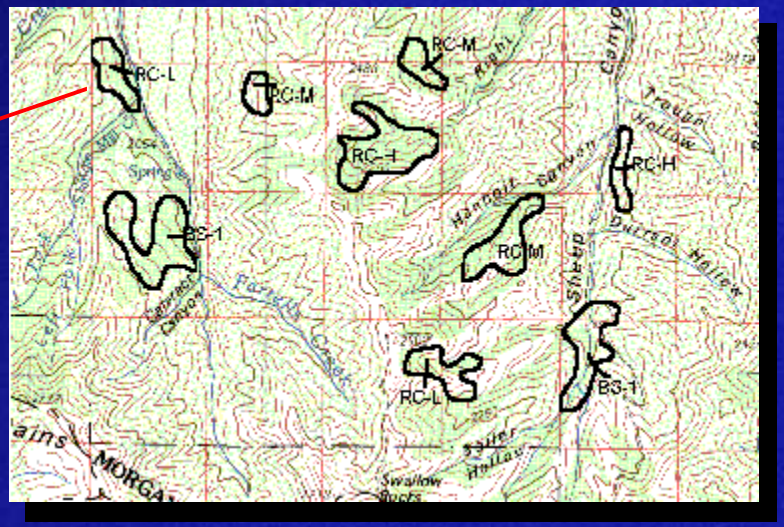
What is Aerial SketchMapping?

- *"A remote sensing technique for observing forest change events from an aircraft and locating them on a map" (modified from McConnell, et al 2000)*



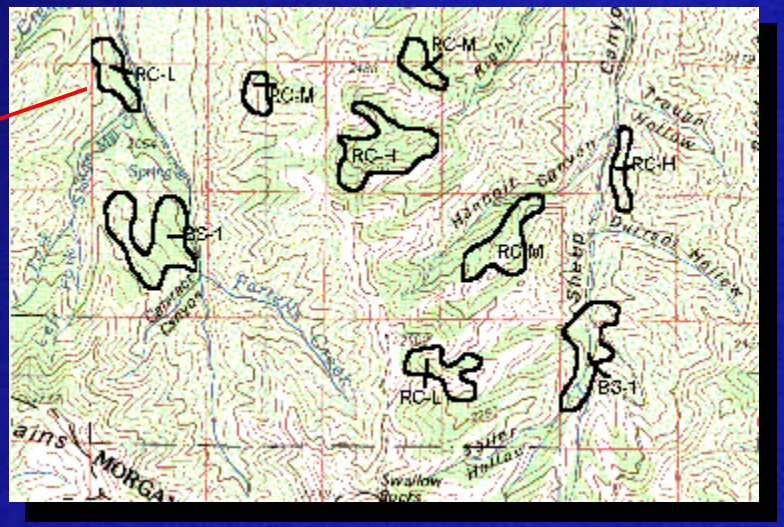
Why aerial sketchmapping?

- Forest health surveys are conducted annually over much of the U.S. by trained aerial observers to locate and map: insects, diseases, weather, fire, and other natural disturbances.



Pros and Cons of Aerial Surveying

- Pro: Aerial surveys are an accurate and cost effective means to cover large areas.
- Con: Traditional methods cumbersome and inefficient



DASM System Development

- RSAC began system development in 1996 looking for the most efficient way to use computers in aerial mapping surveys
- A ‘wish list’ of desirable system features evolved from a survey of the aerial sketchmapping community

The Wish List

1. A **touchscreen** & **stylus** for data entry
2. **Full color display** of raster and vector map data
3. A **live map display** linked to a GPS receiver
4. Display must be **sunlight readable**
5. **Direct transcription** of sketched features (points, lines and areas) into a GIS compatible data set

DASM Nuts & Bolts – 2 Screen

DASM – Field Use

DASM Nuts & Bolts

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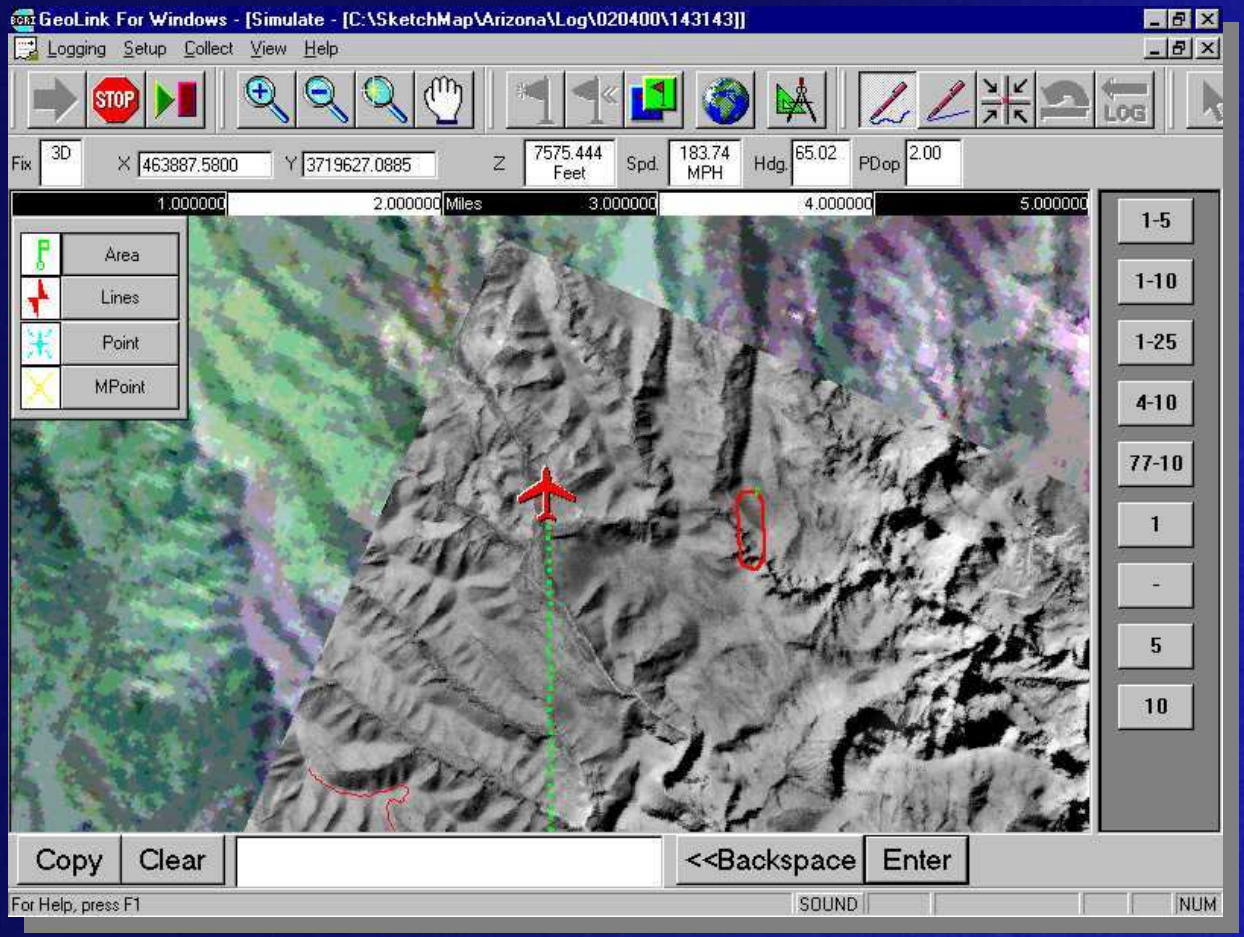
DASM…The Software

Geolink by Michael Baker Jr. was chosen as the best software available.



DASM…The Software

- GeoLink software features:
  - Map display of raster and vector files
  - Attribution of data is done with user-defined quick keys
  - "Heads-up" orientation of map display
  - Output: ESRI shapefiles
- Periodic updates are made to the software based on user feedback.

DASM…GPS

GPS Requirements:

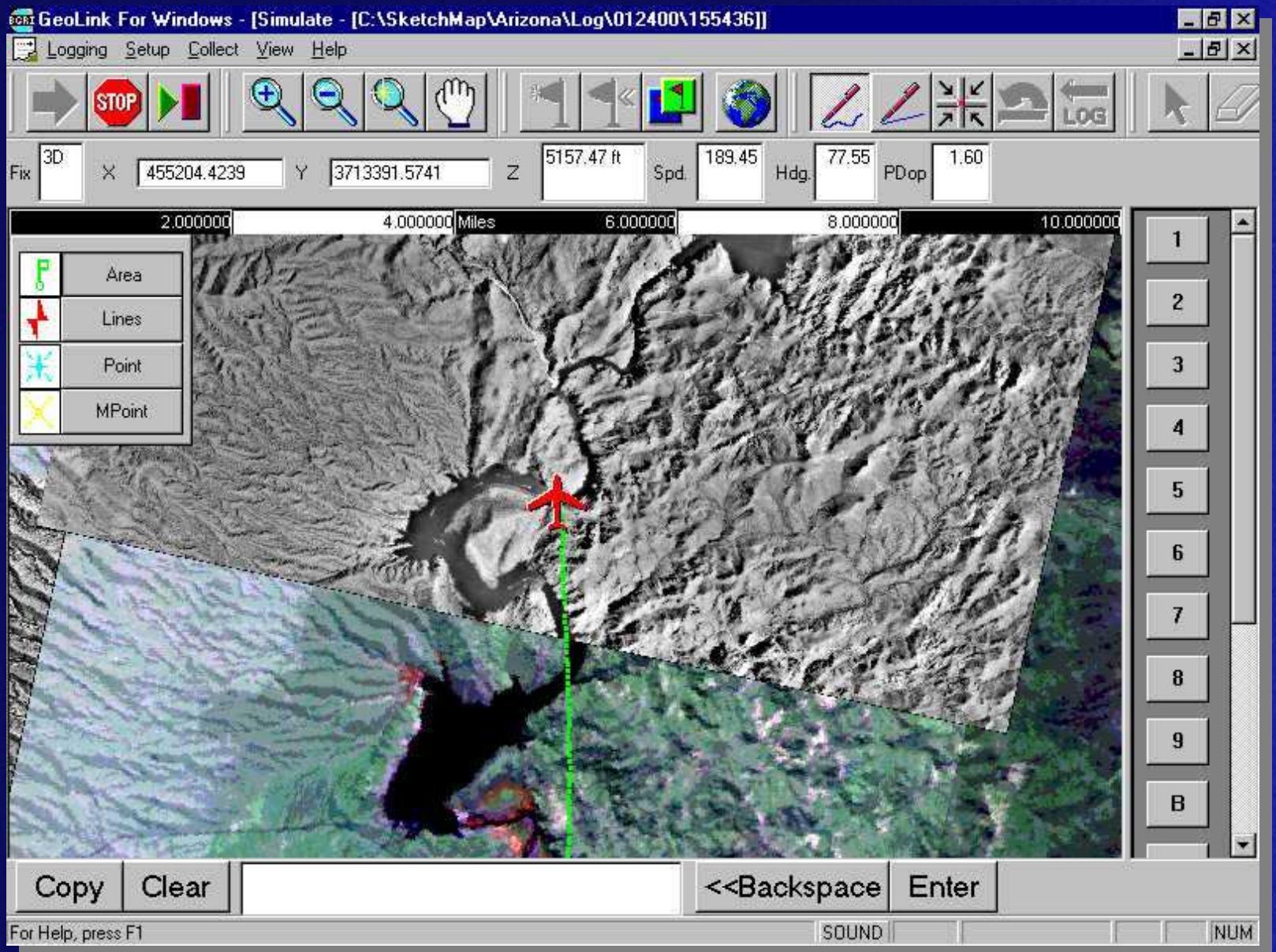
- NMEA 0183
- PC Connection
  - Serial Port
  - USB
  - Bluetooth
- External Antenna

DASM - Background Maps

Options

- USGS Digital Raster Graphics (DRGs)
- Digital OrthoPhotos
- Satellite Imagery – Landsat, etc.
- Vector shapefiles
  - Roads, Streams, Contours, Administrative boundaries

DASM... Screen View



DASM…Post-processing

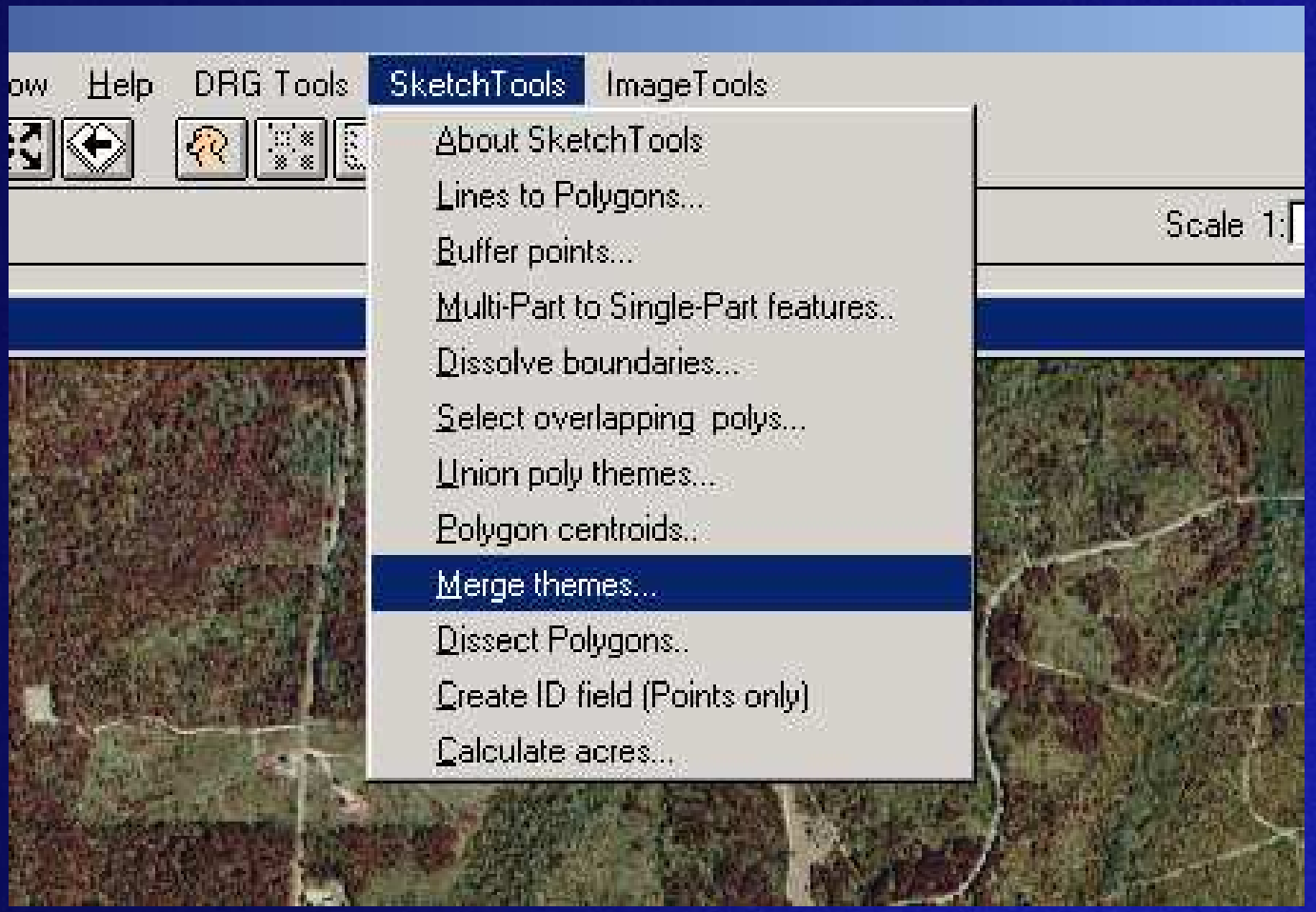
- Resolve overlapping polygons
- Combine shapefiles from multiple surveys
- Create a map of surveyed areas from flightlines
- Calculate acres for mapped polygons

AND

- Output points of interest to GPS for field checks

DASM…SketchTools

SketchTools…an ArcView 3.x GIS extension



DASM…System Cost

2 Screen		All-in-one	
PC Laptop – 14.1” Dell Latitude C640	**$2300**	Hammerhead 10.4” 800x600	**$5200**
Touch screen – 12.1” KDS PB12MAPD	**$4320**	Touch screen	n/a
GPS Receiver	**$305**	GPS Receiver	**$580**
GeoLink S/W	**$1346**	GeoLink S/W	**$1346**
Power Supply	**$100**	Power Supply	n/a
Total	**$8371**	**Total**	**$7126**

DASM Benefits to Aerial Surveys

DASM Provides:

- Improved positional accuracy of sketched features
- Decreased time spent sketching features
- Improved uniformity of data attribution
- Reduced use of cumbersome maps in cockpit
- Elimination of office digitizing (from paper maps)

Improved overall efficiency!!

DASM…Other Applications

- Emerging Uses
  - Training site verification/accuracy assessment for remote sensing classification projects
  - Mapping of invasive weeds: Everglades National Park has flown many hours with the system in a helicopter. Hell's Canyon weeds survey (Star Thistle).
  - Wildlife habitat mapping: Moose surveys in Yakutat
  - Post-fire ground survey (BAER mapping)

DASM…Other Applications

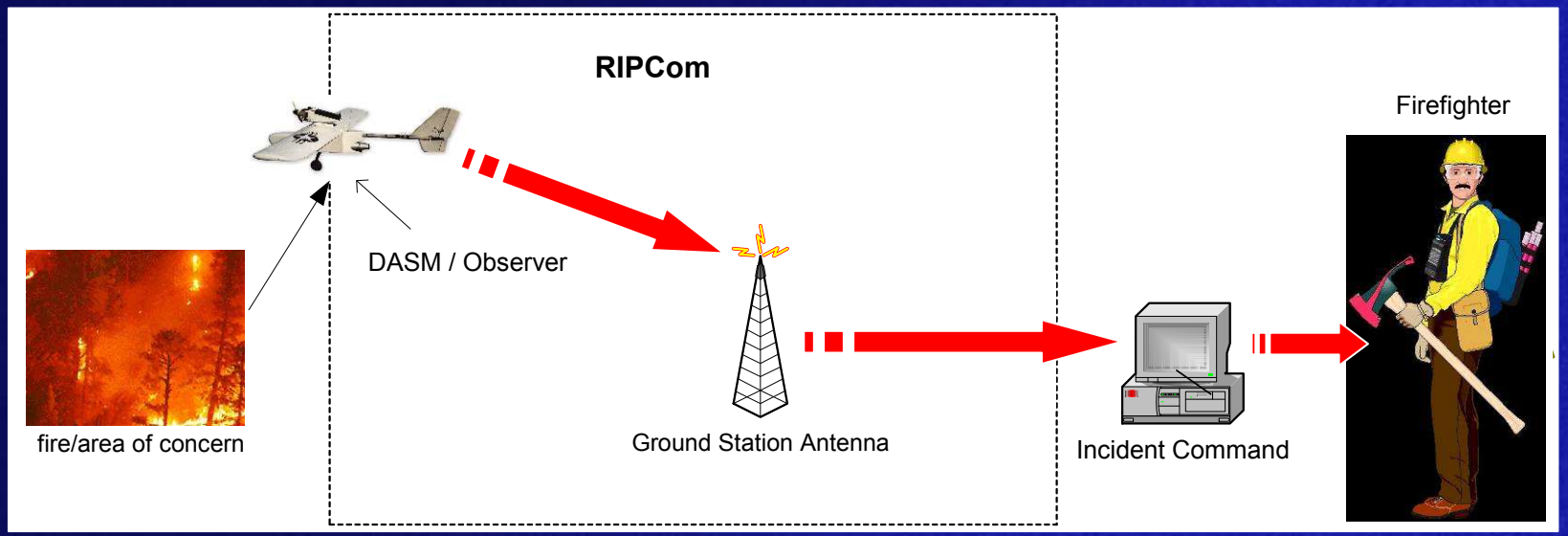
FIRE!!

- Mapping fire perimeters, hotspots, control lines, structures, access routes
- Requires real-time downlinking for best benefit

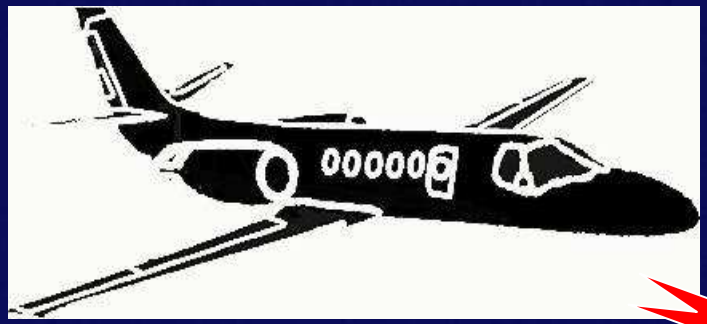
Remote Internet Protocol Comm. System

RipCOM

- Developed by NASA Goddard Space Flight Center
- Can be used with a computer network or a single lap top.
- 2.4 MHz system utilizes 1 watt amplifiers. We are seeking FCC authorization to use 5 watt amplifiers.

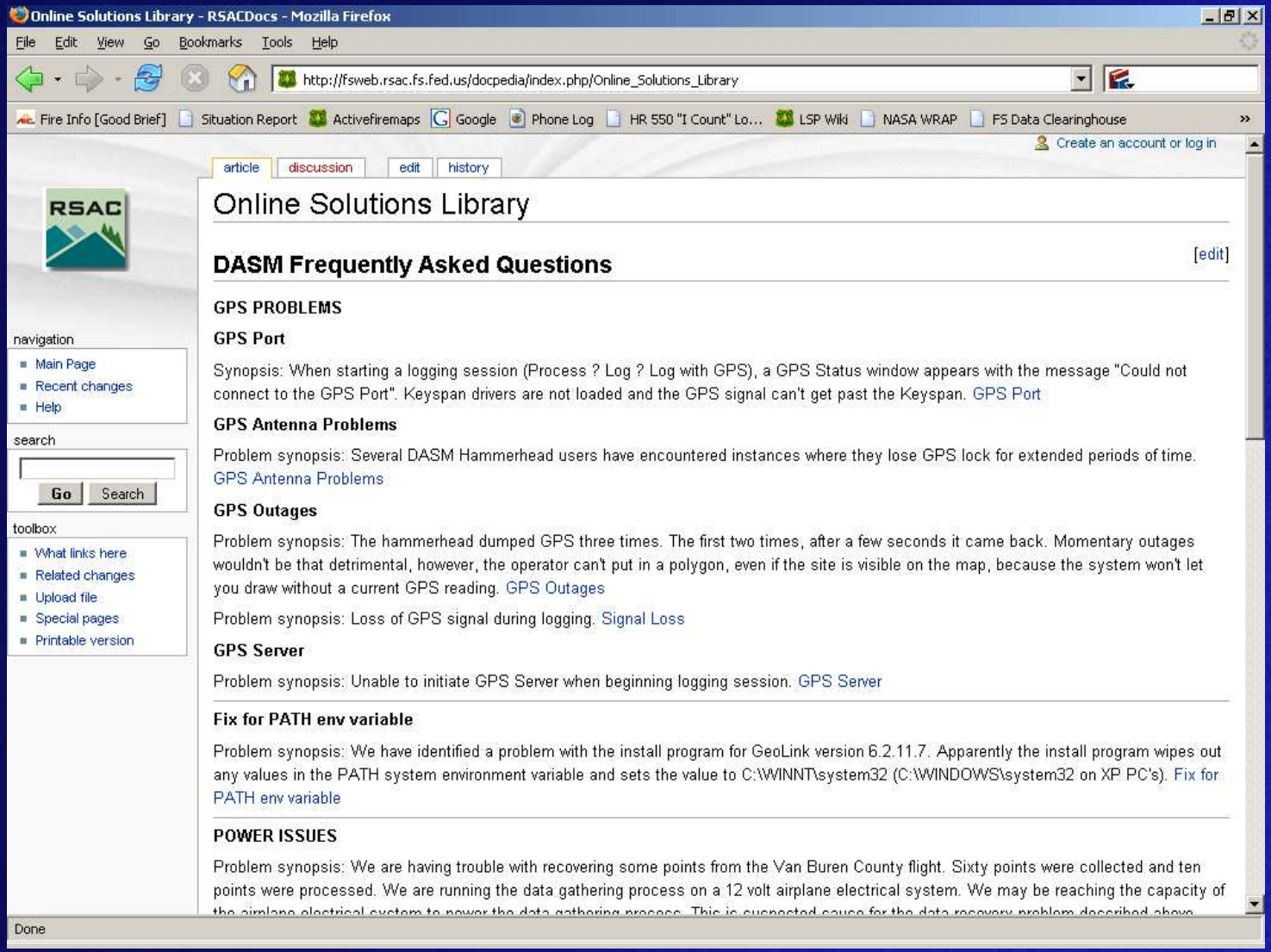


RipCOM to Ground Station



- Aircraft transmits collected data back to incident command
- Data consists of perimeters and hotspots

Training / User Support



http://fsweb.rsac.fs.fed.us/docpedia/index.php/Online_Solutions_Library

Digital Aerial SketchMapping…

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